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The caulescent violets of the southeastern United States

Ezra Brainerd

Of the twelve indigenous species of stemmed violets in the eastern United States, ten occur in the states covered by Dr. Small's Manual, but only one of the ten, *Viola tripartita*, is restricted to this region. Four of the ten are northern species, that find a congenial habitat in the South only in the Appalachian Mountains or foothills.

The caulescent species of *Viola* east of the Rocky Mountains are not as difficult to the student of systematic botany as are the acaulescent species. This is due largely to the fact that the species are fewer and less frequently hybridize with each other, and consequently do not present in the field so many perplexing intermediate forms. The early students of the genus were thus able to present a more accurate account of these species. Indeed their treatment by Schweinitz in 1822 is in most particulars confirmed by recent researches. His chief fault was the common one of his age, a disregard of the claims of priority in the naming of species, so that five of the eleven southern forms are presented under untenable and often misleading names. But his Latin descriptions are so full and accurate, that a careful reading leaves no doubt as to the plant he had in mind, and shows that his work was so thorough and discriminating that after nearly ninety years not a single indigenous species or variety needs to be added to his list.

The ten southern species fall naturally into three sections, readily distinguished by differences in styles and stipules. The first section is marked by a capitate style and by stipules nearly entire and soon scarious; it comprises the four yellow violets and *V. canadensis*.

VIOLA HASTATA Michx. is in several respects unique among the yellow caulescent violets. The dilated basal lobes are broadly rounded, not acute as in the strictly hastate leaf; so that the blade is shaped more like a halberd, or an ancient battle-ax, than a spearhead. The upper surface is often mottled with a lighter green, due to the presence of minute air vessels in the epidermis. Several other species, *V. hirsutula*, *V. villosa*, and *V. Walteri*, have this leaf marking, especially in the South. But the most striking character of *V. hastata* is the long, white, brittle rootstock, resembling that of *Dentaria diphylla*. The other species of the section have short, woody rootstocks with coarse fibrous roots.

VIOLA TRIPARTITA Ell. has the distinction of being the only stemmed violet with cut leaves found east of the Rocky Mountains; but on the Pacific coast it is well matched by *V. lobata*. Though the specific difference between the two is pronounced, they have several characters in common besides the dissected leaves: the same coarse fibrous roots, the same purple tinge on the outside of the otherwise yellow petals, the same marked variability in pubescence, and the same fondness for the companionship of a variety with uncut leaves.

VIOLA TRIPARTITA Ell. var. GLABERRIMA (Ging.) Harper is the name now accepted for this variety of the eastern species. The history of the plant in systematic botany is interesting. It was first published by Schweinitz as a species, *V. striata*,* though he was well aware that the name had already been given to a different species. He describes it as very glabrous—"glaberrima"—but afterwards notes that "in a very few instances hairs were scattered on the nerves of the underside of young leaves." He says further: "Mr. Leconte first found it in our vicinity [Salem, N. C.] and directed my attention to it, and by continued observation, I am well assured of its being a very good and constant species."

Two years later, in DeCandolle's Prodromus, **1**: 300. 1824, Gingins disposed of Schweinitz's *V. striata* as *V. hastata* var. *glaberrima*. This may have been at the suggestion of LeConte, for in his final paper on *Viola*, in 1826, Le Conte, without giving any credit to Gingins, treats both the *V. striata* of Schweinitz and the *V. tripartita* of Elliott as forms of *V. hastata*, adding the following remarkable statement: "*V. striata* Schwein. was formerly taken by me for a distinct species, but by culture I found that it was a mere variety, and sometimes the result of accident. In fact, if the

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*Am. Jour. Sci. **5** : 76. 1822.

stem of *V. hastata* is broken off when it first rises out of the ground, the root forms another stem which never bears hastate or deltoid leaves."* Among LeConte's unpublished drawings of *Viola* is one labeled *V. hastata*, bearing two stems from the same rootstock, one having the characteristic leaves of this species, and the other leaves more like those of *V. striata* Schwein. The picture impresses one as a monstrosity, and the statement as founded on a misapprehension. In my own experience in transplanting violets from the wild I have more than once been astonished at seeing incongruous leaves or capsules on what seemed the same plant, only to find on careful examination the roots of two plants of different species closely entangled. But whatever the cause, LeConte badly blundered in receding from his first judgment that *V. hastata* and Schweinitz's *V. striata* were specifically distinct, a blunder that his successors kept up for nearly seventy years, and that appears in the latest edition of Chapman's Southern Flora and the posthumous volume of Dr. Gray's Synoptical Flora. Dr. Small, in 1897,† was the first since the days of Schweinitz to make clear once more the marked specific difference between *V. hastata* and its supposed varieties.

There have recently been attempts to separate out from *V. tripartita glaberrima* (Ging.) Harper two new species: *V. glaberrima* (Ging.) House,‡ and *V. tenuipes* Pollard;§ both, it seems to me, based on mere fluctuations or trivial differences. In the original description of *V. tenuipes* the petals are said to be beardless; but in my specimens of this proposed species,‖ the three lower petals are plainly bearded. The petals are also said to be quite free from markings; but in both the Auburn specimens and in the type from Chattahoochee, Fla. (seen in the Biltmore herbarium), there are brown veins on the spurred petal, as though the black lines, seen in all allied species, had simply faded out.

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* *V. striata* Schweinitz olim a me pro distincta specie habita: sed a cultura inveni ut mera et interdum fortuita varietas fuisset. Revera, si caulis *V. hastatae* abrumpitur cum primum e terra prodit, radix alterum caulem fundit, qui nunquam folia hastata aut deltoidea producit." LeConte, Ann. Lyc. N. Y. **2**: 151. D 1826.

† Bull. Torrey Club **24**: 494. 30 N 1897.

‡ Torreya **6**: 172. 26 Au 1906.

§ Proc. Biol. Soc. Washington **15**: 201. 1902.

‖ Greene and Pollard's No. Am. Violaceae *33*, Auburn, Ala., April 6, 1901.

VIOLA ERIOCARPA Schwein., according to present rules of nomenclature, must displace *V. scabriuscula*, only mentioned by Schweinitz as a name that he had discarded.* Its specific distinctness from *V. pubescens* has been questioned from the first. But if one had to deal only with the most pronounced forms of each, he would, I think, be quite ready to recognize two species. In regions where both occur the two types run together, as do *V. fimbriatula* and *V. sagittata*. Each species through hybridism seems to borrow at times one or more characters from the other, presenting them in a compromise or in an unmodified form. In the rich dry deciduous forests of the North one usually gets the pure forms of *V. pubescens*. South of Virginia it occurs rarely, if at all, though specimens of *V. tripartita glaberrima* Harper have been often distributed as *V. pubescens*. Accordingly, in North Carolina and in that latitude westward as far as Oklahoma, one finds the genuine *V. eriocarpa* of Schweinitz. It differs from *V. pubescens* Ait. in being nearly glabrous throughout except for its densely woolly capsules, in having several spreading stems (shorter and more leafy) and one to three radical leaves from one rootstock, and in growing in open thickets and rich meadow bottoms. This typical form is seen occasionally northward, especially in the Mississippi Valley; but the intergradient forms are more common.

VIOLA CANADENSIS L. is found in the uplands of the southern Alleghanies, and as far south as Tuscaloosa, Alabama, usually with shorter stems and smaller leaves and flowers than it has northward. The capsules have been described as glabrous in all the manuals; but they are often downy or densely puberulent, a fact that did not escape the careful observation of Schweinitz, who says: "Capsula leviter pubescente."

The second section of our stemmed violets is marked by a slender style not enlarged upward, and by green stipules with sharp often bristly teeth. In the South it is represented by four species.

VIOLA STRIATA Ait. is easily recognized by its white or cream-colored flowers, which appear in early spring, often when the stems

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*In the Elliott herbarium at Charleston, S. C., is a specimen labeled "*Viola eriocarapa* m[ihi]" in the handwriting of Schweinitz. It agrees well with his description, and may serve for all practical purposes as his type.

are but half grown and decumbent. In summer when fully developed the plants may attain a height of six decimeters, and present a very different aspect. Even Schweinitz was betrayed into describing as a new species, *V. repens*,* a form found only "on the rocks of the Saura mountains." It was apparently seen only in May, as he says, "capsula non observata." This error should be placed side by side with his protest against regarding *V. clandestina* Pursh as the summer state of *V. rotundifolia* Michx.; the former with the latter, he says, "can have no affinity whatever"!† These errors would hardly deserve notice, had there not been in recent years so many similar instances, in which the protean forms of a violet have been described under several specific names.

VIOLA CONSPERSA Reichenb. is a third stemmed violet occurring southward only in the Appalachian uplands. The list is long of the various names under which it has passed. In the Britton and Brown Illustrated Flora it is described as *V. labradorica* Schrank, 1818. But this boreal plant seems distinct, being much smaller, bearing only one or two deep violet flowers on a stem, having rounded leaves and narrow stipules; the most southerly stations are the high mountains of New York and New England. Schweinitz, who received the Labrador plant from a missionary friend, named it *Viola punctata*,‡ unaware of the name Schrank had given it four years before. The common species of the northern United States Schweinitz recognizes as *V. uliginosa* Muhl.; but that name had been previously used by Schrader.

The oldest available name is that of Reichenbach, in his Iconographia botanica, seu Plantae criticae **1**: 44. *pl. 52. f. 108*. 1823. Both the description and the colored plate indicate the species unmistakably. The type specimen was sent Reichenbach by Dr. Torrey from New York under the name *V. asarifolia*, a *nomen nudum* of Muhlenberg's Catalogue, doubtless intended for the species in question. But in 1814 Pursh had published as *V. asarifolia* a plant from the mountains of North Carolina, now identified with *V. sororia* Willd. Knowing only *V. asarifolia*

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*Loc. cit. 70.

†Loc. cit. 63.

‡Loc. cit. 67.

Pursh, Reichenbach correctly states that it differs greatly from Dr. Torrey's plant, which he accordingly renames *V. conspersa* (i. e., besprinkled), from the numerous minute dark dots and lines that he observed on the lower surface of the leaves. This phenomenon is often seen in herbarium specimens, not only of this, but of many other species of *Viola*, though not in the living plant. It is probably a pathological condition, caused by some bacterial activity in the tissue of plants that have been long in drying. *Viola punctata* Schwein., above mentioned, evidently got its name for a similar reason, as the "glandular punctures," which the author observed on the upper surface of the leaves, are not ordinarily present.

VIOLA WALTERI House is an allied plant which botanists have been slow to recognize as specifically distinct, and still slower properly to christen. Walter, in 1788, called it *V. canina*, but it is not the European plant so named by Linnaeus; Elliott, in 1817, placed it under *V. striata*, but it is not the species so named by Aiton; Schweinitz, 1822, called it *V. debilis*, but it is not what Michaux had called *V. debilis;* Dr. Britton, 1894, called it *V. multicaulis*, but the name had been previously used by Jordan. We may hope that *V. Walteri* has come to stay. The species, though not common, is widely distributed through the southern states from the Atlantic coast to Texas.

Viola Walteri affords an excellent illustration of the metamorphism of stems into stolons. The petaliferous flowers of early spring apparently rise from tufts of radical leaves along with ascending stems. These soon lengthen, become prostrate, and bear through the season leaves and apetalous flowers on long slender axillary peduncles. In autumn the prostrate stems are usually buried under fallen leaves, and surviving the winter send up in spring from their tips rosettes of leaves, form roots, and become new plants. In this method of reproduction *V. Walteri* closely resembles *V. odorata*, classed as a stemless violet with surface runners that bear leaves and cleistogamous flowers, as well as form new plants.

VIOLA ROSTRATA Muhl. is noteworthy for being without a synonym; its extremely long spur distinguishes it conspicuously from all other violets. Yet aside from its floral characters it closely resembles *V. conspersa;* and in midsummer the two are easily confused. It is the fourth of the stemmed violets whose southern range is restricted to the Appalachian region.

The third and last section of stemmed violets in the southeastern United States is the one to which the European pansy belongs; it is represented in the New World by two very similar species, one introduced and one indigenous.

The latter, VIOLA RAFINESQUII Greene, is widely distributed from New York to Georgia and westward to Michigan and Texas. It so closely resembles the introduced species, *V. arvensis*, that many American botanists (even Dr. Gray) have failed to distinguish them. The native plant is much smaller and more delicate, with petals about twice the length of the sepals, those of the other species being hardly as long as the sepals.

VIOLA ARVENSIS Murr. will need to be recognized as an introduced plant in the South as well as in the North, and may become a weed in cultivated ground in America as it is in Europe. I found it last April abundant and troublesome in a field where shrubs were propagated, at Biltmore, N. C.

Synopsis of the caulescent violets of the southeastern United States

§1. Style capitate, beakless; spur short; stipules nearly entire, soon scarious.

- Petals yellow.
  - Rootstock long, thick, whitish, bearing crisp, capillary roots. *V. hastata.*
  - Rootstock short, woody, brown, bearing coarse, fibrous roots.
    - Petals tinged outside with violet.
      - Leaves 3-lobed to 3-divided. *V. tripartita.*
      - Leaves uncut, ovate or rhombic-ovate. *V. tripartita* var. *glaberrima.*
    - Petals yellow outside.
      - Sparingly pubescent, root leaves usually 1–3. *V. eriocarpa.*
      - Markedly pubescent, root leaves usually wanting. *V. pubescens.*
- Petals white inside, usually violet outside. *V. canadensis.*

§2. Style not capitate, slender; length of spur at least twice the width; stipules bristly toothed; somewhat herbaceous.

- Spur less than 8 mm. long; lateral petals bearded.
  - Petals white, or cream-colored. *V. striata.*
  - Petals violet blue.
    - Stems ascending; later leaves subacuminate. *V. conspersa.*
    - Stems prostrate; leaves obtuse. *V. Walteri.*
- Spur 10–20 mm. long, slender, lateral petals beardless. *V. rostrata.*

§3. Style much enlarged upward into a globose, hollow summit; stipules large, leaflike, pectinate at base.

Upper leaves entire, or obscurely crenulate; petals twice the length of sepals. *V. Rafinesquii.*

Upper leaves plainly crenate; petals usually shorter than the sepals. *V. arvensis.*

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